

**THAT WHICH IS CLAIMED IS:**

1. A virtual sensor (10) of exhaust emissions from a fuel-injection endothermic engine (9) comprising a combustion chamber in each of its cylinders, a fuel injector serving each combustion chamber, and an electronic fuel-injection control unit (8); characterized in that it comprises an input interface (1) receiving a signal from at least one pressure sensor mounted in at least one combustion chamber of said engine (9); a second input interface (2) receiving signals from said electronic fuel-injection control unit (8); and a calculation block to provide estimates of the amounts of said emissions based on said pressure and said signals.

2. A virtual sensor according to Claim 1, characterized in that said signals are measurements of certain parameters of the engine operation, such as the crank angle and the injection start time.

3. A virtual sensor according to Claim 1, characterized in that it comprises a signal extraction block (4) placed between said interface (1) and said calculation block (5) to extract the pressure signal.

4. A virtual sensor according to Claim 1, characterized in that it comprises a signal processing block (3) placed between said second interface (2) and said calculation block (5).

5. A virtual sensor according to Claim 1, characterized in that said calculation block (5) is operated according to a soft computing model.

6. A virtual sensor according to Claim 1, characterized in that said calculation block (5) is a neuro-fuzzy processor.

7. A virtual sensor according to Claim 1, characterized in that said calculation block comprises at least four inputs and two outputs; said inputs receiving signals corresponding to a maximum pressure and a mean pressure as measured by the sensor, as well as to combustion start time and injection start time.

8. A virtual sensor according to Claim 7, characterized in that said outputs are electric signals corresponding to an estimate of nitrogen compounds and particulates in the exhaust gases from the engine.

9. A fuel injection control system for a fuel injection endothermic engine (9) comprising a combustion chamber in each of its cylinders, a fuel injector serving each combustion chamber, and an electronic fuel-injection control unit (8), characterized in that it incorporates at least one pressure sensor in at least one combustion chamber, as well as at least one virtual sensor (10) as claimed in Claim 1.

10. A fuel injection control system according to Claim 9, characterized in that said engine is a common-rail diesel engine.